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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/941,004	08/28/2001	Atsushi Komoro	TIJ-30154	6202
23494	7590	09/09/2004	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			AGGARWAL, YOGESH K	
			ART UNIT	PAPER NUMBER
			2615	7

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/941,004

Applicant(s)

KOMORO ET AL.

Examiner

Yogesh K Aggarwal

Art Unit

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____  | 6) <input type="checkbox"/> Other: ____                                     |

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***Drawings***

1. Figure 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 4, 5, 7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Kwong (US Patent # 6,445,591).

[Claim 1]

Applicant's admitted prior art teaches an image pickup element (figure 3, element 22), optical glass (figure 3, element 21) furnished on the front surface of said image pickup element, a connection member (figure 3, element 24) that connects an insulated circuit board (figure 3, element 25).

However Applicant's admitted prior art fails to teach a stacked circuit board that is furnished on the rear surface of said image pickup element and that has a wiring pattern, and a

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connection member that electrically connects said image pickup element and the wiring pattern of said stacked circuit board and said stacked circuit board being formed with insulated circuit boards, in which are packaged electronic circuits that include wiring patterns, stacked in multiple layers in the diametral direction perpendicular to the length direction of the microminiature image pickup device and having a cavity formed as indentation in the diametral direction thereof, a first electronic component mounted in said cavity , and a second electronic component mounted on the surface of said stacked circuit board.

Kwong teaches a stacked circuit board (figure 1, element 10) used in a computer system (col. 1 lines 11-25), which is analogous art and can be used in any electronic system including Digital cameras, endoscopes, PDAs etc. The insulated circuit board 25 shown as admitted prior art can be replaced by the stacked circuit board (10) to connect at the rear surface of the image pickup device (admitted prior art, figure 3 element 22). The stacked circuit has a wiring pattern (col. 1 lines 26-37), and will inherently have a connection member (admitted prior art, figure 3 element 24) that electrically connects said image pickup element and the wiring pattern of said stacked circuit board as disclosed in applicant's admitted prior art (when the insulated circuit board 25 is replaced with stacked circuit board 10) and said stacked circuit board being formed with insulated circuit boards (col. 5 lines 2-4), in which are packaged electronic circuits (figure 1, elements 12, 14, 16, 18) that include wiring patterns which are shown as stacked in multiple layers in the diametral direction perpendicular to the length direction of the microminiature image pickup device when the insulated circuit board 25 of the applicant's admitted prior art is replaced with a stacked circuit board 10 and having a cavity (figure 1, element 62) formed as indentation in the diametral direction thereof, a first electronic component (figure 1, element 46)

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mounted in said cavity (col. 5 lines 18-34) and a second electronic component (figure 1, element 44) mounted on the surface of said stacked circuit board (col. 5 lines 11-18) in order to increase the density of electronic circuits.

Therefore taking the combined teachings of Applicant's admitted prior art and Kwong it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a stacked circuit board that is furnished on the rear surface of said image pickup element and that has a wiring pattern, and a connection member that electrically connects said image pickup element and the wiring pattern of said stacked circuit board and said stacked circuit board being formed with insulated circuit boards, in which are packaged electronic circuits that include wiring patterns, stacked in multiple layers in the diametral direction perpendicular to the length direction of the microminiature image pickup device and having a cavity formed as indentation in the diametral direction thereof, a first electronic component mounted in said cavity , and a second electronic component mounted on the surface of said stacked circuit board. The benefit of doing so would be to increase the density of electronic components on multilayer printed circuit boards as taught in Kwong (col. 1 lines 44-51).

[Claim 2]

Kwong teaches that the electronic component (figure 1, element 46) is connected to the electrically conductive contact pads formed on the electrically conductive signal layer 36 (col. 5 lines 25-29).

[Claims 4 and 7]

Applicant's admitted prior art teaches wherein the image pickup device is a CCD (figure 3, element 22).

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[Claims 5, 9 and 11]

Applicant's admitted prior art teaches wherein said connection member is a TAB tape (figure 3, element 24).

4. Claims 3, 6, 8, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Kwong (US Patent # 6,445,591) and in further view of Yamashita (US Patent # 5,875,100).

[Claims 3, 6]

Applicant's admitted prior in view of Kwong fail to teach wherein the electronic component is mounted in said cavity in a bare chip state. However Yamashita teaches that the electronic component can be mounted into a cavity in a bare chip state (col. 4 lines 62-67, col. 5 lines 1-5) in order to combine a bare chip with a multi-chip module. Therefore taking the combined teachings of Applicant's admitted prior art, Kwong and Yamashita it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have the electronic component mounted in said cavity in a bare chip state. The benefit of doing so would be to use to use the multichip module in association with barechip, thus further enhancing the density of the electronic components.

[Claim 8]

Applicant's admitted prior art teaches wherein the image pickup device is a CCD (figure 3, element 22).

[Claim 10]

Applicant's admitted prior art teaches wherein said connection member is a TAB tape (figure 3, element 24).

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*Conclusion*

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

i. Yarush et al. (US Patent # 6,554,765) discloses an endoscope with vertical stacked printed circuit board assembly and connected to a CCD array (figure 2).

ii. Kwong (US Patent # 6,459,593).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K Aggarwal whose telephone number is (703) 305-0346. The examiner can normally be reached on M-F 9:00AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on (703) 308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YKA  
August 26, 2004

  
TUAN HO  
PRIMARY EXAMINER